



Docket No.: 1422-0707PUS1

(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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In re Patent Application of:  
Takanori KAWAI et al.

Application No.: 10/565,383

Confirmation No.: 6103

Filed: January 23, 2006

Art Unit: 1794

For: **CONDITIONING AGENT FOR FRY FOOD**

Examiner: Chawla, Jyoti

**DECLARATION UNDER 37 CFR 1.132**

COMMISSIONER FOR PATENTS  
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Madam:

I, Hiromichi KOUNO, residing in Mie-ken, Japan, hereby declares and states as follows:

1. I am one of the co-inventors of U.S. Application Serial No. 10/565,383 filed on January 23, 2006, entitled CONDITIONING AGENT FOR FRY FOOD. I am thoroughly familiar with the contents of said Application, its prosecution before the United States Patent and Trademark Office and the references cited therein.
2. I am a graduate of University of Fukui, Faculty of Engineering and received a bachelor's degree in the year 1998, majoring in material chemistry.

3. I have been employed in Taiyo Kagaku Co., Ltd. in the year 1998 and have been assigned to the Research Laboratories in the year 2001.

4. I have been involved in the research and development of fry foods since 2001.

5. The following experiments were conducted by myself or under my direct supervision and control in order to verify that a remarkable difference in an effect of suppressing oil absorption by the difference in the methods of adjusting particle sizes is clarified.

## METHODS AND RESULTS

### PREPARATION EXAMPLES FOR POWDERS

Powders of guar gum, HM pectin, and alginic acid were prepared as follows.

#### Powder A-1 (Guar Gum)

A commercially available guar gum (average particle size: 51.35  $\mu\text{m}$ , manufactured by MAYPRO Industries Inc. BU) was directly used without a pulverization treatment. This powder is referred to as Powder A-1.

#### Powder B-1 (Guar Gum)

The commercially available guar gum powder (Powder A-1) was pulverized in the same manner as in Example 1 of the present specification. Specifically, Powder A-1 was pulverized with a frictional pulverizer (manufactured by Hosokawa Micron

Corporation) under the conditions of a pulverization temperature of -50°C and a peripheral speed of a rotor of 73 m/sec, to give Powder B-1.

Powder C-1 (Guar Gum)

The commercially available guar gum powder (Powder A-1) was classified with a sieve having a sieve opening of 20  $\mu\text{m}$  without pulverization. This powder is referred to as Powder C-1.

Powder A-2 (Pectin)

A commercially available pectin powder (HM Pectin, average particle size: 37.20  $\mu\text{m}$ , manufactured by CP Kelco) was directly used without a pulverization treatment. This powder is referred to as Powder A-2.

Powder B-2 (Pectin)

The commercially available pectin powder (Powder A-2) was pulverized in the same manner as in Example 2 of the present specification. Specifically, Powder A-2 was pulverized with a counter jet mill (manufactured by Hosokawa Micron Corporation) under the conditions of a pulverization air flow rate of 5000  $\text{m}^3/\text{hour}$  (20°C, 600 kPa), to give Powder B-2.

Powder C-2 (Pectin)

The commercially available pectin powder (Powder A-2) was classified with a sieve having a sieve opening of 20  $\mu\text{m}$  without pulverization. This powder is referred to as Powder C-2.

Powder A-3 (Alginic Acid)

A commercially available alginic acid powder (average particle size: 36.33  $\mu\text{m}$ , manufactured by KIMICA Corporation) was directly used without a pulverization treatment. This powder is referred to as Powder A-3.

Powder B-3 (Alginic Acid)

The commercially available alginic acid powder (Powder A-3) was pulverized in the same manner as in Example 3 of the present specification. Specifically, Powder A-3 was pulverized with a freeze pulverizer (manufactured by Hosokawa Micron Corporation) under the conditions of a pulverization temperature of -100°C and a peripheral speed of a rotor of 73 m/sec, to give Powder B-3.

Powder C-3 (Alginic Acid)

The commercially available alginic acid powder (Powder A-3) was classified with a sieve having a sieve opening of 20  $\mu\text{m}$  without pulverization. This powder is referred to as Powder C-3.

PREPARATION OF DOUGHNUTS

The doughnuts were produced in the same manner as in Test Example 2 of the present specification, except that a pulverized product was replaced with each powder obtained above (Powers A-1 to A-3, B-1 to B-3, and C-1 to C-3).

Specifically, 30 g of butter and 30 g of a powder sugar were combined and kneaded well into a creamy state. Thereto was added a mixture of 50 g of a whole egg liquid and 50 g of cow's milk little by little, and the mixture was mixed. The resulting mixture, 200 g of flour (soft flour), 8 g of baking powder, and 2 g of each powder were

placed in a mixer, and the ingredients were mixed for 3 minutes. The resulting dough was set aside for 10 minutes while keeping the resulting dough from being dried, and the dough was formed into a doughnut shape having an inner diameter of 4 cm, an outer diameter of 6 cm, and a height of 0.9 cm. Next, the doughnut-shaped dough was deep-fried in palm oil at about 180°C for 3 minutes, to give each of doughnuts (Products A-1 to A-3, B-1 to B-3, and C-1 to C-3).

#### EVALUATIONS OF OIL ABSORPTION, MOUTHFEEL AND TASTE

The oil absorption of the resulting doughnut was evaluated by determining the oil content in the dough. The lower the oil content in the dough, the lower the oil absorption of the doughnut. The oil content in the dough was obtained according to the method of obtaining the oil content in the batter of Test Example 1 of the present specification.

In addition, the doughnut was evaluated by 20 panelists for mouthfeel and taste.

The evaluation results for mouthfeel and taste are shown as an average score of 20 panelists wherein those that are highly excellent are ranked 10 points; those that are notably excellent are ranked 9 points; those that are excellent are ranked 8 points; those that are fair are ranked 7 points; those that are somewhat poor are ranked 6 points; those that are notably poor are ranked 5 points; and those that are very poor are ranked 4 points.

The above results are summarized in Table A.

Table A

	Average Particle Size of Powder	Oil Content in Dough (% by weight)	Mouthfeel	Taste
Product A-1	51.35 $\mu\text{m}$	23.50%	5.4	6.8
Product B-1	18.79 $\mu\text{m}$	15.00%	9.2	8
Product C-1	18.52 $\mu\text{m}$	21.70%	6.2	7
Product A-2	37.20 $\mu\text{m}$	23.10%	6	6.4
Product B-2	3.33 $\mu\text{m}$	14.10%	9.8	8.6
Product C-2	17.36 $\mu\text{m}$	22.40%	6	6.6
Product A-3	36.33 $\mu\text{m}$	19.00%	7.2	4.6
Product B-3	18.96 $\mu\text{m}$	12.30%	9.4	7.8
Product C-3	18.44 $\mu\text{m}$	17.60%	7	5.2

### DISCUSSION

Powders B-1, B-2, and B-3 obtained by pulverization to an average particle size of 20  $\mu\text{m}$  or less show unexpectedly excellent improvements in oil content in dough, mouthfeel, and taste, as compared to those of Powders A-1, A-2, and A-3, a direct use of commercially available products without pulverization treatment, and Powders C-1, C-2, and C-3, subjected only to classifying treatment without the pulverization. Therefore, it can be seen that it is very important to pulverize the powder to an average particle size of 20  $\mu\text{m}$  or less in order for the powders to exhibit an effect of suppressing oil absorption and to exhibit an effect of improving mouthfeel and taste.

**Statement Under 18 U.S.C. § 1001**

The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Hiromichi KOUNO  
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July 13, 2009  
Date